UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ECOSYSTEMS,
TRIBAL AND PUBLIC
AFFAIRS

April 22, 2014

Bridget Psarianos, Project Lead
c/o GMT-1 Draft SEIS Comments
222 West 7th Avenue, Stop #13
Anchorage, Alaska 99513

RE: EPA comments on the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth Unit Development Project Draft Supplemental Environmental Impact Statement, EPA Project # 04-005-BLM.

Dear Ms. Psarianos:

We have reviewed the above-mentioned Draft Supplemental Environmental Impact Statement in accordance with our responsibilities under National Environmental Policy Act and Section 309 of the Clean Air Act, as well as our role as NEPA cooperating agency. The Draft SEIS evaluates several alternatives for developing the Greater Mooses Tooth-1 (GMT-1) project within the National Petroleum Reserve-Alaska, as well as the No Action alternative. The Bureau of Land Management (BLM) did not identify a preferred alternative in the Draft SEIS.

Under our NEPA Review policy and procedures, we rate draft EIS documents by considering both the adequacy of the document, and the potential environmental impacts of the action. We appreciate the full range of alternatives developed in the Draft SEIS and find that, in general, the document does an excellent job of describing the environmental impacts of the alternatives. However, because we believe additional information is needed to decide whether alternatives and/or mitigation should be modified, we are assigning an adequacy rating of "2" (Insufficient Information) to the document.

We have identified concerns regarding air quality and aquatic resources (specifically, vegetation, wetlands, and hydrology). Based on the analysis of potential effects in the Draft SEIS, we find that Alternatives A (CPAI Proposed GMT1), C (Alternative Access-Nuiqsut) and D (Roadless Access) warrant a rating of EC (Environmental Concern) due to potential limitations to emergency response capabilities, greater impacts to the residents of Nuiqsut, greater emissions, avoidable impacts to Fish Creek and/or additional fill requirements. We rate the Avoid Fish Creek Setback alternative (Alternative B) LO (Lack of Objections) due to the superior emergency response capability (as a road alternative), fewer direct impacts to the Fish Creek watershed, fewer impacts to Nuiqsut residents, as well as generally less fill requirements than Alternatives C and D. We also commend the BLM and the applicant, ConocoPhillips Alaska, for incorporating additional mitigation measures which were previously considered in the original Alpine Satellites Development Plan EIS into the proposed project and alternatives. Additional detail about our concerns and an explanation of our rating system are attached (Enclosures 1 and 3).

In our review role and as a cooperating agency, we also often assist the lead federal agency in identifying the environmentally preferred alternative. Per guidance from the Council on Environmental Quality[1] the environmentally preferred alternative is the alternative that causes the least damage to the biological and physical environment. At this stage of planning and analysis, it appears that Alternative B would best promote the national environmental policy as expressed in NEPA's Section 101, and that it would be a valid choice for the environmentally preferred alternative in the Final SEIS.

However, we recognize that further, more detailed analyses or modifications of alternatives can tip the scales toward the choice of another alternative as environmentally preferable. We understand that an additional roadless alternative incorporating seasonal drilling may be considered in the Final SEIS. Because this alternative would address many of the concerns related to impacts on air quality, Nuiqsut residents, caribou, and emergency response, while lessening the need for an all-season road, we believe that, when fully analyzed, this alternative may prove to be environmentally preferable. A caveat to such a choice would be the potential for this alternative to exceed the national or state air quality standards due to increased frequency or type of aircraft, or other emission sources. If such exceedances are anticipated, and cannot be fully mitigated, this alternative could not be identified as environmentally preferred. If this alternative is determined to be reasonable, we recommend that it be fully analyzed.

Finally, we want to emphasize that in order to be permitted, the selected alternative must comply with the 404(b)(1) guidelines under Section 404 of the Clean Water Act, and must be the least environmentally damaging practicable alternative (LEDPA). We encourage the applicant, the BLM and the U.S. Army Corps of Engineers to continue to work closely with the EPA to determine the LEDPA in the 404 permitting process. Part of the basis for the LEDPA decision is consideration of the functions and values of the wetlands potentially impacted in the project area. We have identified specific deficiencies in the wetlands functional assessment (Appendix E) that we believe need to be addressed in order to appropriately analyze and address these impacts to wetlands in the project area, particularly for the 404 permitting process (Enclosure 2).

We appreciate the opportunity to review this Draft SEIS. If you have questions concerning our comments, please contact me at (206) 553-1601 or reichgott.christine@epa.gov, or you may contact Jennifer Curtis of my staff in Anchorage at (907) 271-6324 or curtis.jennifer@epa.gov.

Sincerely,

Christine B. Reichgott

Christine B. Reichgott, Manager
Environmental Review and Sediments Management Unit

Enclosures

[1] http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm

Enclosure 1
EPA Region 10 Detailed Comments on the Alpine Satellite Development Plan for the Proposed Greater Mooses Tooth Unit Development Project Draft Supplemental Environmental Impact Statement

Comparison of Alternatives
In general, all alternatives represent fewer impacts to a variety of resources as compared to alternatives identified in the Alpine Satellites Development Plan Final EIS. We are particularly pleased with the reduced fill, thus resulting in reduced impacts to wetlands and other waters of the U.S. We believe that the impacts analysis does a good job at differentiating among alternatives, although we have concerns regarding the evaluation of wetlands functions (please see below and enclosure 2).

Based on this comparison, we have concluded that Alternative B, represents the most protective of resources, with a particular focus on greater emergency response capability due to year-round road access, fewer direct impacts to the Fish Creek watershed, generally less fill requirements, and fewer impacts to Nuiqsut residents due to reduced aircraft traffic and improved road access.

Air Quality
The following comments and questions regarding the air analysis are offered according to the specific sections in the Draft SEIS.

In Section 3.2.3.1, please provide references for the discussed meteorological variable and period of record. Explain why the ConocoPhillips Alaska monitoring station data was not included.

The second paragraph on page 68 mentions twelve stations in the NPR-A. Please clarify why temperatures and winds from the twelve stations are not discussed and presented in this section. We recommend that air quality dispersion potential be discussed in this section (e.g. prevailing winds, mixing height, onshore/offshore wind flows, etc.).

In 3.2.3.2, please include information regarding the meteorology, representativeness, period of record, and Alaska Department of Environmental Conservation acceptability for use in dispersion modeling.

On page 69, second paragraph, we recommend additional information on new construction after 2004 as well as to the east and the west, if applicable.

Under 4.2.3.2, for the first paragraph on page 202, if the project schedule is extended, please identify if the additional hours of meteorology would change the impacts and your conclusion. Also, we recommend that this section include a sentence that there are no Class I areas within X-number of miles of GMT-1 in the second paragraph. In first sentence of the third paragraph, please provide a list of the equipment and emission rates. Also for the third paragraph, please show the emission rates in a table (or location of the table in the EIS.), identify "other regulated pollutants", provide a justification for limiting consideration to PM10, and provide information concerning any secondary PM10 formation.

In the fourth paragraph on page 202, please define "seasons". In the fifth paragraph, first sentence, please provide location of the table for Alternative A in the EIS.

In the fourth paragraph on page 203, we recommend that all activities and alternatives should be compared with Class II increments and NAAQS. In the fifth paragraph, we recommend that appropriate references be provided.

For Table 4.2-9, please explain how the modeling was completed in terms of the meteorological year used. For Table 4.2-10, please clarify if emissions were modeled for 3 or 5 separate years. Under the Hazardous Air Pollutants, please consider including a table for all emission source types.

On page 205, second paragraph, please clarify if a cumulative analysis was performed (i.e., alternative plus nearby sources). In the final paragraph on page 205, please describe if there is any concurrent operations of the five scenarios (i.e., source contributions).

For first paragraph on page 207, please include reference to calculation methodology. In the second paragraph, please clarify if a PM monitor will be employed to verify the adequacy of watering. In the fourth paragraph, please explain why only an increment analysis was performed for the Infill Drilling scenario.

For Table 4.2-12, please clarify if the State of Alaska has increment consumption limitations for NO2, PM10 and PM2.5 in their regulations. For Table 4.2-13, please clarify if a cumulative analysis was performed (i.e., alternative plus nearby sources).

On page 209, first paragraph, statements are made regarding ozone in the polar region. Please provide references for those statements. In the second paragraph, please provide a reference regarding the EPA evidence and discuss Deadhorse speciation measurements.

On page 210, first paragraph, please reference the table showing that Class increments are not exceeded.

On page 213, first paragraph, please consider if additional hours of modeling could create a significant impact. In the third paragraph, please define "slightly higher".

On page 215, in the second paragraph, please explain how much higher ongoing mobile source emissions in Nuiqsut would be, and how much higher construction and operational emissions for Alternative C. For the third paragraph, please include an extrapolated emissions table.

For Table 4.2-32, please identify if there is a State of Alaska regulation on increment exceedance. For Table 4.2-33, please consider secondary PM formation contribution.

Table 4.2-44 shows PM emissions as being greatest in Alternative C. As such, we believe Alternative C should be modeled.

Appendix K

In the *ConocoPhillips Alaska, Inc. Greater Mooses Tooth 1 Alternative D (Roadless) Air Quality Impact Analysis, Final*, Section 1.0, first paragraph, we recommend that BLM compare concentrations to Class II increments at maximum point of impact as well. Also, please confirm that the 33 wells identified in the second paragraph were modeled. In Section 1.1.2, please confirm if the new emissions were modeled.

Under Section 2.0, please confirm if the U.S. Fish and Wildlife Service, as signatory to the air quality Memorandum of Understanding, has reviewed and accepted the emissions inventory. Under Table 2-15, we recommend an additional table be developed to compare the preferred alternative emissions and the roadless alternative for GMT1.

For 3.5.1, please provide a reference for this technique discussed in the last sentence (page 3-5) and if used in the compliance demonstration. For 3.5.2 please provide a reference for this modeling technique. In Section 3.6, please provide each reference used in this technique as well. In Section 3.9, please discuss project ambient boundary with respect state and federal definitions. In Section 3.10 it appears that a cumulative analysis has not been included in this appendix. We recommend that one is developed and included in the Final SEIS Appendix K.

In Tables 5-1, 5-2, 5-3, 5-4, and 5-6, for the predicted violations, please provide possible mitigation measures. For 5.1.3 we recommend that a NO_2 quantitative analysis be included as it is preferable over a qualitative analysis. Please add "and subject to PSD" to end of first sentence of third paragraph on page 5-14. Also, please clarify the first sentence under "CCP Emissions and CCP Ambient Monitoring Data Analysis" on page 5-14.

Table 5-8 is shown on page 5-14 but not referenced in the text. Please clarify.

In the last paragraph of 5.1.6, we note that there are secondary PM 2.5 measurements at Deadhorse and Wainwright. We recommend that the secondary measurements be discussed in the EIS.

In 5.1.8 please compare the predicted Class II increments and cumulative impacts of the proposed alternative (Alternative A) with the roadless alternative (Alternative D).

Finally, in October 2013, Julie Wroble from the EPA Region 10 provided comments relating to air toxics analysis in Appendix K. These comments were responded to on October 18, 2013, in a document entitled "ConocoPhillips Alaska, Inc. Greater Mooses Tooth 1 Air Quality Impact Analysis – Final, ATTACHMENT F - Response to Comments". While we were satisfied with the responses to these comments, subsequent changes were not incorporated into the Draft SEIS or Appendix K. We recommend that these responses be reflected in some manner, (e.g. attached to Appendix K) in the Final SEIS.

Vegetation and Wetlands

Impacts to vegetation and wetlands are evaluated in the Draft SEIS using the impact criteria explained in Table 4.3-1. These impact criteria measure the magnitude of impacts, in part, by wetland functional categories, as determined by the "Wetland Functional Assessment for the Greater Mooses Tooth Unit Development Project – 2013, Final Report" by ABR, Inc., dated December 2013, found in Appendix E of the Draft SEIS. In general, we have concerns regarding both the wetland functional assessment and the impact criteria as they are used to compare impacts to vegetation and wetlands between alternatives.

Wetlands Functional Assessment

The adequacy of this wetland functional assessment (WFA) is important for two reasons. First, the findings of the WFA are used in the impact criteria for evaluating impacts to vegetation and wetlands for the four action alternatives. See, for example, Table 4.3-1, where "low intensity" is defined as, "Impacting <5% of any vegetation type or <5% of the total area of Functional Category I and II

wetlands within the project study area". Second, in the Clean Water Act Section 404 (CWA 404) permitting context, wetland functional assessments are used to derive measures of values; values are used to derive a measure of loss of aquatic resources; and losses are used to derive the amount of compensatory mitigation that may be required of a project applicant to offset those losses. An inadequate WFA may lead to erroneous conclusions about the extent of environmental impacts as analyzed in the EIS, and the extent of losses of aquatic resources as evaluated in a CWA 404 permit.

We believe the WFA to be inadequate for three reasons. First, it employs a methodology that is deficient. Second, we have conducted a thorough re-assessment of the saturated graminoid shrub wetland type (the most prevalent type in the GMT-1 project area), using the same data sheet and evaluation questions as are used in the WFA, and we have come to the conclusion that these wetlands perform functions at a higher level than stated in the WFA. Third, the U.S. Army Corps of Engineers has ranked the functional performance of wetlands of the same types in a project area immediately adjacent to the GMT-1 project at a higher level than that proposed in the WFA.

The wetland functional assessment methodology is deficient. The WFA is based on the *Literature Review and Evaluation Rationale of the Wetland Evaluation Technique* (Adamus et al. 1991) and the *Rapid Procedure for Assessing Wetland Functional Capacity* (Magee 1998). These two methods apply to temperate ecosystems in the Lower 48. The assessment is carried out by answering evaluation questions on a data form (one data form for each wetland functional class), "Waters and Wetland Functions Data Form – Alaska Regulatory Best Professional Judgment, Characterization for North Slope, Alaska (Modified by ABR Inc. Feb 2013)". The WFA states that this data form was derived in consultation with USACE-Alaska District personnel, and modified from Adamus et al. (1991) and Magee (1998) to address the functions that reflect North Slope wetlands and waters of the U.S.

We find that many of the questions on the data form do not apply well to the very different Arctic ecosystems (i.e. permafrost-driven, not discrete, and with decumbent vegetation) that the Adamus et al (1991) and Magee (1998) methods were designed to address. We are not aware of any consultation with the Corps which modified the data form, and have not received any guidance from the Corps indicating that a different procedure should be followed starting in February 2013. Whereas Adamus et al (1991) takes more than 200 pages to explain how to evaluate a suite of functions in Lower 48 systems, this WFA does not explain how the evaluation questions are to be interpreted and answered. Many of the questions are vague such that meaningful answers cannot be determined. A desktop analysis does not adequately capture many functional attributes that on-the-ground observations would confirm. For all of these reasons, erroneous conclusions in ranking functional categories may have been drawn in the GMT-1 WFA.

EPA reevaluation of wetland functions performed by the saturated graminoid shrub type. We have performed a reevaluation of the functions performed by the saturated graminoid shrub wetland functional class, using the same data form and answering the same evaluation questions as were used in the GMT-1 WFA (see Attachment 2). We chose to reevaluate this wetland type because it is the most prevalent type in the project footprint, mapped as 82.6 acres out of a total wetland impact acreage of 91.22, or 90.55% of the impacted area (WFA, Table 3). Instances where the evaluation question does not apply to Arctic ecosystems, is vague, or for which answers cannot be determined using a desktop analysis are explained in the Rationale column of each table in the reevaluation. ABR ranked the wetland functional classes into functional categories using the Alaska Region Regulatory Guidance Letter 09-01 criteria, and based on its analysis, found the saturated graminoid shrub type to have an

overall Moderate to Low ranking, assigning it as Category III. Our overall finding is that the saturated graminoid shrub type instead performs wetland functions at a High level. Our analysis and reasoning is explained in detail in Enclosure 2.

The Corps has determined a higher functional ranking for the same type of wetlands for the Nuiqsut Spur Road project, an area immediately adjacent to the GMT-1 project area. The U.S. Army Corps of Engineers, Alaska District, has recently issued a CWA 404 permit for the Nuiqsut Spur Road project (POA-2013-68, Colville River, issued on March 12, 2014). The Nuiqsut Spur Road project is located immediately adjacent to the GMT-1 project area, and consists of a 5.8 mile long road running from the village of Nuiqsut northward to the CD-5 access road, and an 11-acre laydown pad located at the junction of the two roads. The adequacy of the wetland functional assessment performed for the Nuiqsut Spur Road project as originally proposed was questioned by the reviewing agencies, including EPA and U.S. Fish and Wildlife Service. The most prevalent wetland functional class is the same for both projects: for the GMT-1 project, it is called saturated graminoid shrub, and for the Nuiqsut Spur Road project, it consists of moist tussock tundra and moist sedge/shrub meadow. (Note: the GMT-1 WFA, Table 2 identifies the saturated graminoid shrub type as including, or "lumping" the moist tussock tundra and moist sedge/shrub meadow types together.) The wetland functional classes for both the Nuiqsut Spur Road project and the GMT-1 project were derived from the same ITU mapping performed by Jorgenson et al. (2002, 2003).

In its decision on the Nuiqsut Spur Road project, the Corps assigned Category II to the moist tussock tundra and moist sedge/shrub meadow types. Because the moist tussock tundra and moist sedge/shrub meadow types for the Nuiqsut Spur Road project were determined by the Corps to be rated as Category II, we believe that the same type for the GMT-1 project, saturated graminoid shrub, would also merit no less a ranking than Category II.

Impact Criteria for Vegetation and Wetlands

The impact criteria for vegetation and wetlands are given in Table 4.3-1. If the purpose of conducting an impact analysis using these criteria is to identify differences between the alternatives, such that one may stand out as having more or fewer impacts when compared to the others, we find that these criteria do not serve well to make such a distinction. In particular, the "medium intensity" impact is defined as "Impacting 5 to 25% of a vegetation type or 5% to 10% of the total area of Functional Category I and II wetlands within the project study area."

Considering the second part of this criterion (impacting 5% to 10% of the total area of Functional Category I and II wetlands within the project study area), Table 4.3-4 indicates the total project study area to be 102,487 acres. Five percent of 102,487 acres is 5,124 acres. The entire acreage, across all vegetation types and including indirect impacts, for Alternative A is 595.3 acres; this equates to 0.58% of the total project study area, and is only about one-tenth of the 5,124 acre threshold to be considered medium intensity. In the case of Alternative C, the alternative with the largest acreage of direct and indirect impacts, 1,368.7 acres equates to 1.33% of the total project study area, still far from the 5% threshold to be considered of medium intensity. In other words, considering *all* of the vegetation types, and assuming that they would *all* be Functional Category I or II wetlands, there is no possibility of exceeding the 5% threshold to meet medium intensity.

The first part of the criterion, (impacting 5 to 25% of a vegetation type), is skewed toward capturing only the rarest (least acreage) vegetation types. In fact, Alternatives A and C were rated as exceeding

the 5% intensity threshold based solely on one vegetation type, Cassiope dwarf shrub tundra, which occupies only 85.6 acres out of the entire 102,487 acre project study area (0.1%), and then only when the 300 ft. indirect zone of impact is applied. By this decision alone, and with all other impact criteria findings (duration, extent, context) being equal, were Alternatives A and C bumped up from an overall Minor impact ranking to an overall Moderate impact rating (Table 4.1-2). These impact criteria, therefore, have pointed out the importance of one rare vegetation type, but have not captured the differences in other impacts to vegetation and wetlands across alternatives. This is not a very meaningful way to differentiate between alternatives for vegetation and wetlands.

Impacts to vegetation and wetlands are qualitatively very well described in Section 4.3.1 of the Draft SEIS. To grasp a more quantitative view of differences in impacts to vegetation and wetlands across alternatives, we suggest augmenting the impact criteria with the information in Table 4.3-4, where acreages of indirect impacts of construction on vegetation and wetlands based on a 300-foot zone of impact are listed. Alternative C will impact more than twice the acreage of Alternative A (1,368.7 vs 595.3). Alternatives A and B will impact similar amounts of acreage (595.3 vs. 613.7). Alternative D will impact about half the acreage of Alternative A (275.9 vs. 595.3).

Hydrology

The Draft SEIS concludes that impacts to water resources "tend to be proportional to the amount of area impacted by infrastructure, with modifications due to specific activities and locations. However, for all action alternatives the intensity of impacts is characterized as minor and of localized extent." (Section 4.2.2.6). With respect to impacts on hydrology, we do not agree. The effects of gravel fill for an airstrip, road or pad are well described in Section 4.2.2.1. Quantitative differences between the alternatives for inundation resulting from new roads are given in Table 4.2-6, where the areas of increased stage and decreased stage for Alternative D are shown as "negligible". Likewise, in Table 4.2-7, Summary of Major Components Potentially Impacting Hydrology, Alternative D is shown with a much shorter road, no bridges, and a fraction of the number of culverts when compared to the other alternatives. The gravel fill for Alternative D will be consolidated in one locality. By contrast, the road required under the other three alternatives will perpendicularly cross the hydrologic gradient, the topographic gradient, and the wind direction gradient. The likelihood of the road behaving as a dam to disrupt hydrology is discussed in the Draft SEIS. We believe that the intensity of impacts to hydrology is less for Alternative D, and that the extent is more localized for Alternative D, than for the other three alternatives. The impacts to hydrology are not proportional to the amount of area impacted by infrastructure, but are rather related to the configuration of gravel fill. Whether the fill is strung across the landscape (as for a road) or consolidated at one location (as for a pad) makes a difference in impacts to hydrology, and this difference has not been captured in the impacts analysis in Section 4.2.2.6.

Monitoring

As per the 2013 NPR-A Integrated Activity Plan Record of Decision, we encourage the BLM to develop a comprehensive monitoring plan for the project in consultation with the applicable resource agencies and local stakeholders. This monitoring should occur during construction and operation and have particular focus on air quality, hydrology, and subsistence. We believe this information will be helpful not only for the understanding of this project, but also for future projects within the NPR-A.

Enclosure 2
EPA Evaluation of Functions for the Saturated Graminoid Shrub Wetland Functional Class in the Appendix E Wetland Functional Assessment for the Greater Mooses Tooth Unit Development Project - 2013

EPA offers a reevaluation of functions for the Saturated Graminoid Shrub wetland functional class in the tables (1-A through 1-H) that follow. There is a table for seven of the eight functions that ABR evaluated in the *Wetland Functional Assessment For The Greater Mooses Tooth Unit Development Project - 2013* (WFA) (ABR 2013) on pp. A-20 and A-21, and summarized on p. A-22. In the first column of each table are the best professional judgment characterization questions for each function. In the second column are the answers to these questions as given by ABR. In the third column are EPA's answers to these questions. In the fourth column are EPA's rationales for its answers to the questions.

A summary of ABR's and EPA's rankings of the functions is given in Table 2.

Table 1-A. Flood Flow Regulation (Storage and Desynchronization)

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
A1. Wetland occurs in a zone with relatively deep active layers.	No	Not determined (N/D)	This attribute cannot be determined from a desktop analysis, without ground-derived data. Further, "relatively deep" is not defined, and even if depth of active layer were available for this wetland type, the break-point between the type exhibiting relatively deep active layers (a "Y" answer) and not having relatively deep active layers (an "N") answer is not determined. The saturated graminoid shrub type develops an active layer tens of centimeters deep every summer.
A2. Wetland has a dense herbaceous or woody layer.	Yes	Yes	EPA agrees with ABR's characterization of this attribute.
A3. Wetland or water is capable of retaining much higher volumes of water during storm events than under normal rainfall conditions.	Yes	Yes	EPA agrees with ABR's characterization of this attribute.
A4. Wetland or water is a closed (depressional) system subject to flooding or shows evidence of flooding.	No	Yes	The saturated graminoid shrub type is not a closed depressional system. However, it is subject to annual flooding during break-up. Michael Baker Jr., Inc. (2013) (hereinafter, "Baker 2013") documents overbank flooding from the Ublutuoch River onto adjacent tundra during June 2013 break-up (see pp. 27-36, including photos).
A5. If flow-through, wetland or water has constricted outlet with signs of fluctuating water levels, algal mats, and/or lodged debris.	No	Not applicable (N/A)	This characterization question does not apply to the saturated graminoid shrub type, because it is not a "flow-through" system. During breakup and subsequent thaw, however, it does act partly as a "flow-through" system, delivering surface and very shallow subsurface flow to adjacent waters.
A6. Wetland or water receives floodwater from an adjacent water course at least once every 10 years.	No	Yes	Receipt of floodwater by adjacent wetlands from the Ublutuoch River during 2013 break-up is documented by Baker (2013). Table 4.4 gives peak annual stages estimates for the Ublutuoch

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
			River as 9.8 feet BPMSL for the 2-year recurrence interval, 10.6 feet BPMSL for the 5-year recurrence interval, and 10.8 feet BPMSL for the 10-year recurrence interval. The flattening-out of peak annual stage estimates at approximately 10.8 feet BPMSL for all recurrence intervals above 10 years (as shown in Graph 4.2) is explained by floodwater from the Ublutuoch River overtopping the river banks and flowing onto adjacent wetlands during break-up at an interval of 10 years. The same is true at other water course crossings of the proposed GMT-1 road route, that saturated graminoid shrub wetlands could receive floodwater from adjacent streams once every 10 years (e.g. S4 and S5 streams as identified in Baker (2013)). Note also that ABR answered question B2 (slow-moving or still water is present or occurs during flooding that happens at least once every 10 years) as a "Y", which is inconsistent with ABR's answer to this A6 question.
A7. Floodwaters enter and flow through wetland predominantly as sheet flow rather than channel flow.	No	Yes	In addition to saturated graminoid shrub type wetlands adjacent to water courses (e.g. Ublutuoch River, S4 and S5 streams) receiving floodwaters from those water courses, the saturated graminoid shrub type wetlands contribute sheet flow every year at break-up, due to snow melt. Baker (2013) demonstrates sheet flow in numerous photographs taken during the 2013 spring break-up (e.g. Photos 3.2, 3.6, 3.8, 3.9, 3.10, 3.11, 3.12, 3.13, 3.14).

Rating for Flood Flow Regulation. ABR rated the saturated graminoid shrub type for the flood flow regulation function as moderate, based on two "Y" answers out of seven possible questions. ABR also comments (on page A-22) that the wetland is found commonly throughout the study area, and that it is well vegetated but not subject to frequent flood events so only provides moderate value for this function.

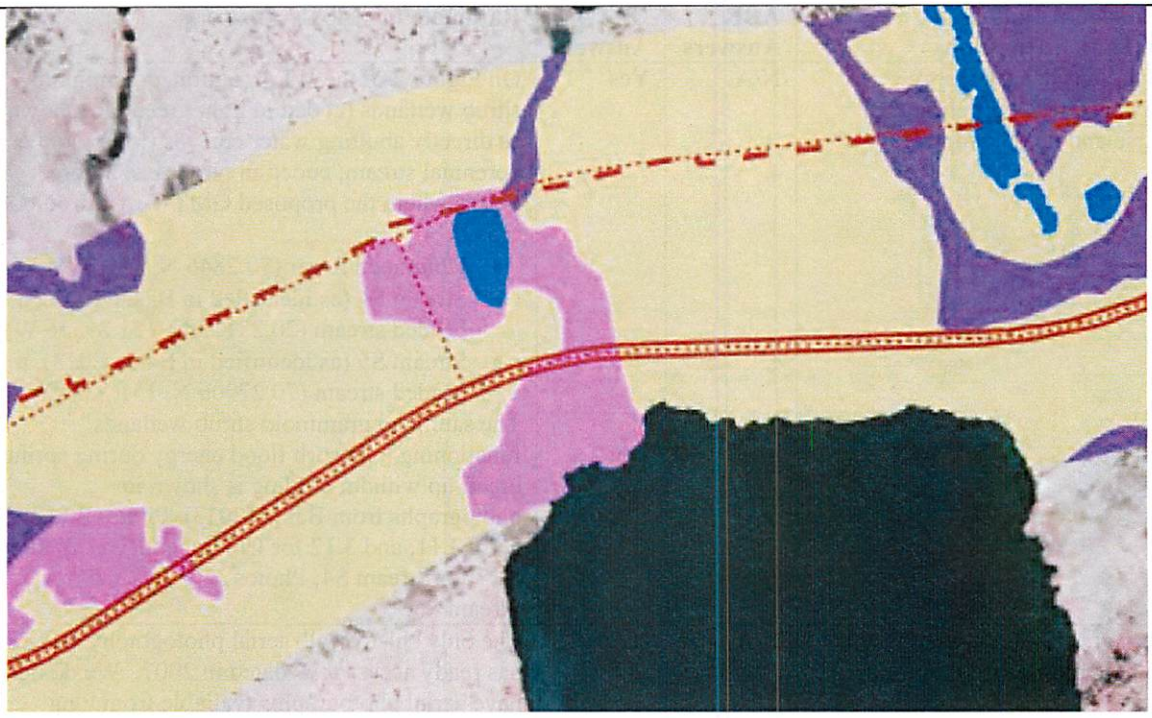
EPA finds five "Y" answers out of five possible questions. (Note that two of the seven questions could not be answered because one of the questions was not applicable to this wetland type, and the answer to another question could not be determined based on a desktop analysis.) Further, the fact that this wetland type is common throughout the study area does not affect its ability to perform the flood flow regulation function. This wetland type functions to regulate flood flow every spring during the break-up event, by receiving and transmitting snow melt down-gradient, and by receiving overbank flooding from adjacent water courses, which occurs at least every 10 years. EPA rates saturated graminoid shrub as high for the flood flow regulation function.

Table 1-B. Sediment, Nutrient (N and P), Toxicant Removal

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
B1. Sediment, nutrients and/or toxicants (from tillage, mining, construction or other sources of pollution) appear to be or are likely to be entering the wetland or water.	Yes	Yes	EPA agrees with ABR's characterization of this attribute. Dust and gravel will be deposited onto saturated graminoid shrub wetlands adjacent to the GMT-1 road and pad.
B2. Slow-moving or still water is present or occurs during flooding that happens at least once every 10 years.	Yes	Yes	EPA agrees with ABR's characterization of this attribute.
B3. Dense (>50% cover) herbaceous vegetation is present.	Yes	Yes	EPA agrees with ABR's characterization of this attribute.
B4. At least moderate interspersion of vegetation and water is present or occurs during flooding that happens at least once every 10 years	No	Yes	Baker (2013) documents many observations of interspersion of water and vegetation during and after the spring break-up, especially noted as occurring in polygon depressions (i.e. patterned ground tundra, which is in the saturated graminoid shrub wetland type). Some examples: • "On June 9, the Clover C area was mostly snow-free with local melt present in surrounding tundra polygons." (p. 25) • "On June 28…Flow was contained within polygon depressions (Photo 3.4)" (p. 25) • "On June 1, local melt was present within polygon depressions on the surrounding tundra." (p. 27) • "On June 6,…surrounding tundra polygon depressions were filled with local melt or persistent snow." (p. 29) • "local melt accumulating in polygon depressions" (p. 58) Further, the interspersion of water and vegetation persists after break-up and into the end of the growing season. This is plainly seen in Figure 1 below. The saturated graminoid shrub wetlands are characterized by patterened ground with polygon troughs full of water in mid-August.
B5. Sediment deposits are present (evidence of deposition during floods).	No	N/D, N/A	EPA believes that this attribute cannot be determined using a desktop analysis. It is very likely, however, that sediments (specifically, dust and gravel) will be carried by wind and vehicle spray from the GMT-1 road and pad onto adjacent saturated graminoid shrub wetlands. On the Arctic coastal plain, the primary vector for deposition of sediments (which are pollutants) is from wind, not water.
B6. Thick surface organic horizon and/or abundant fine organic litter is present.	No	Yes	Table 2 in the WFA describes the saturated graminoid shrub class, and states that dwarf and low ericaceous shrubs are common. These shrubs produce fine organic litter every growing season. Further, moist tussock tundra is a component of the saturated graminoid shrub class (as stated in Table 2 of the WFA.) Tussocks form because of profuse growth of vascular plants, and organic litter would be present.

Rating for Sediment, Nutrient, and Toxicant Removal. ABR rated the saturated graminoid shrub wetlands as moderate for the sediment, nutrient and toxicant removal function, based on three "Y" answers out of a possible six questions. ABR also comments (on page A-22) that the wetland is not exposed to frequent flood events so only provides moderate value for this function.

EPA finds five "Y" answers out of five possible questions. (Note that one of the six questions could not be answered because the answer could not be determined using a desktop analysis, and because the question was not applicable to the Arctic coastal plain.) At the current time, the saturated graminoid shrub wetlands are in an unpolluted, undisturbed state. After GMT-1 road and pad construction, these wetlands will be exposed to indirect impacts including gravel spray and covering by wind-borne fugitive dust. Saturated graminoid shrub wetlands, being characterized by 100% vegetative cover and water, would intercept windborne dust until smothered, dessicated and no longer able to sustain vegetative growth. Annual flooding during spring break-up will convey pollutants down-gradient, and removal will continue to occur especially in polygon troughs connected to adjacent waterbodies. EPA ranks saturated graminoid shrub wetlands as high in performing the sediment, nutrient and toxicant removal function.



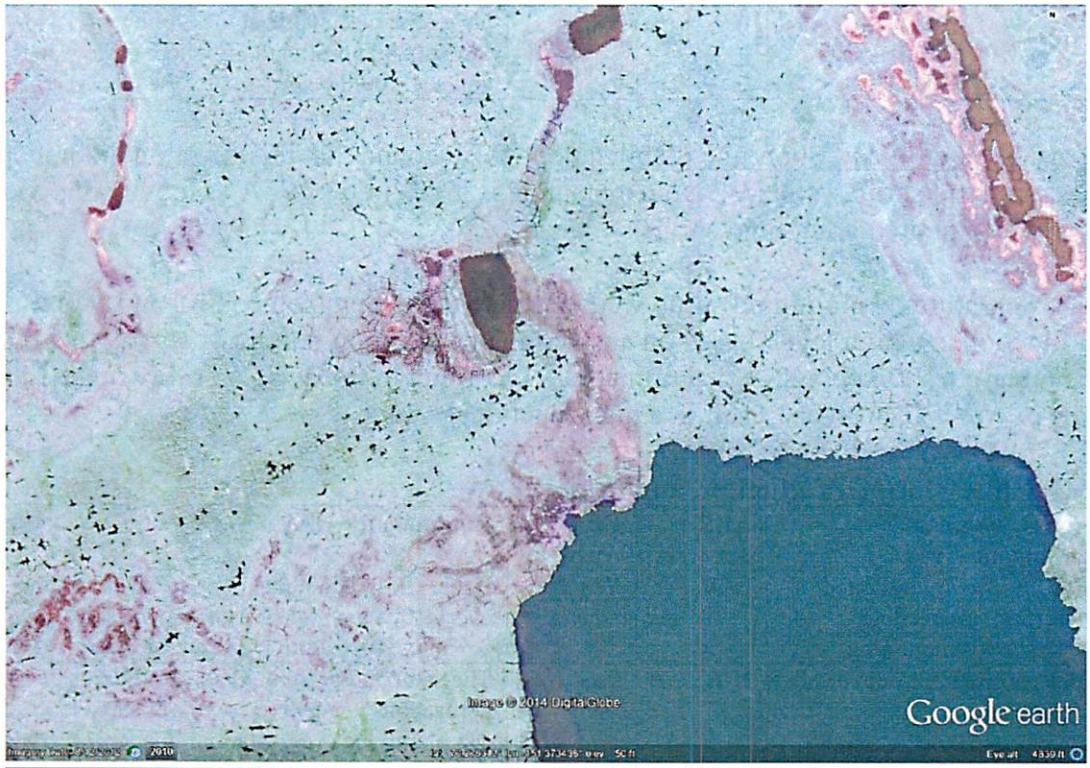


Figure 1. Top photo is excerpted from Figure 2 of GMT-1 Wetland Functional Assessment; light green shading is saturated graminoid shrub type. Bottom photo is from GoogleEarth image dated August 12, 2012; note water in polygon troughs interspersed with vegetation, in the saturated graminoid type. The geographic area depicted here corresponds to Michael Baker Jr.,

Table 1-C. Erosion Control and Shoreline Stabilization

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
C1. Wetland has dense, energy absorbing vegetation bordering the water course and no evidence of erosion.	N/A	Yes	On Figure 2 of the WFA, saturated graminoid shrub wetlands (coded in light green) are shown as directly abutting water courses (lower perennial stream, coded in turquoise) at three places where the proposed GMT-1 road would cross: • Ublutuoch River (70.2846 N, 151.2575 W) • Stream S4 (as identified in Baker 2013), a beaded stream (70.28113 N, 151.29356 W) • Stream S5 (as identified in Baker 2013), a beaded stream (70.27906 N, 151.3294 W). The saturated graminoid shrub wetlands' functioning to absorb flood energy during spring break-up without eroding is shown in photographs from Baker (2013): Photos 3.8, 3.9, 3.10, 3.11, and 3.12 for Ublutuoch River; Photo 3.17 for Stream S4; Photos 3.19 and 3.20 for Stream S5.
C2. Historical aerial photography (if available) indicates stable shoreline features.	N/A	N/D	The only "historical" aerial photography that EPA has ready access to is dated in 2007. We do not have aerial photography available from long enough ago to determine if streambank features have remained stable at the Ublutuoch River, Stream S4 and Stream S5 where these water courses would be crossed by the GMT-1 road.

Rating for Erosion Control and Shoreline Stabilization. ABR found that this function did not apply to the saturated graminoid shrub wetlands. No explanation is given in the WFA as to why this function would not apply to saturated graminoid shrub wetlands.

EPA finds that the saturated graminoid shrub wetlands perform the erosion control and shoreline stabilization function at a high level, based on answering one question out of two as "Y", with the answer to the other question being not determinable. According to the decision rule contained in ABR's data form, one or two "Y" answers result in a high functional rating.

Table 1-D. Organic Matter Production and Export

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
D1. Wetland is flooded at least once every 10 years. If no, proceed no further, wetland is low functioning.	N/A	Yes	Baker (2013) documents flooding at least once every 10 years. See EPA rationale for question A6 above for additional discussion.
D2. Wetland has at least 30% cover of herbaceous vegetation.	N/A	Yes	The saturated graminoid shrub wetlands have an herbaceous vegetative cover of nearly 100%, as can plainly be seen on aerial imagery.
D3. Woody plants in wetland are mostly deciduous.	N/A	Yes	The saturated graminoid shrub wetland functional class is comprised of moist sedge shrub tundra and moist tussock tundra (WFA Table 2); these two vegetation classes are described in Jorgenson et al 2003 (Table 7). Woody plants in the moist sedge-shrub tundra vegetation type include *Dryas integrifolia, Salix reticulata, Salix lanata*

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
			richardsonii, and *Salix planifoia pulchra.* Woody plants in the tussock tundra vegetation type include *Vaccinium vitis-idaea, Salix planifolia pulchra, Betula nana, Salix phlebophylla, Dryas integrifolia,* and *Salix reticulata.* These woody plants are mostly deciduous.
D4. High degree of plant community structure, vegetation density, and species richness present.	N/A	Yes	These attributes cannot be determined from aerial photography or satellite imagery alone; ground studies would be required to describe these vegetation attributes. The WFA also relies, however, on ITU mapping as described in Jorgenson et al (2003). Descriptions for the moist sedge shrub tundra and tussock tundra vegetation classes are given in Jorgensen et al (2003), at Table 7. • For plant community structure, both moist sedge shrub tundra and tussock tundra vegetation types contain non-vascular plants, sedges, grasses, and shrubs; EPA concludes this to be a high degree of plant community structure, especially when considered in the Arctic context. • In its current state, vegetation density in the proposed GMT-1 road and pad area is high because, except for waterbodies and water courses, vegetative cover is nearly 100%. This attribute is plainly seen on aerial photography and imagery. Neither the wetland functional class map (Figure 2 of WFA) nor the vegetation map in Jorgenson 2003 (Figure 8) show any barren or partially vegetated areas in the GMT-1 road corridor study area. • For species richness, 15 plant species are listed for moist sedge shrub tundra, and 12 plant species are listed for tussock tundra; EPA concludes these numbers of species to indicate a high degree of species richness when contrasted to other vegetation types in the NE NPR-A area, e.g. fresh sedge marsh (which can consist of only a single plant species).
D5. Interspersion of vegetation and water is at least moderate.	N/A	Yes	Refer to EPA rationale in B4 above.

Rating for Organic Matter Production and Export. ABR found that this function did not apply to the saturated graminoid shrub wetlands. No explanation is given in the WFA as to why this function would not apply to saturated graminoid shrub wetlands.

EPA finds that saturated graminoid shrub wetlands perform the organic matter production and export function at a high level, based on five "Y" answers out of a possible five questions, using this dataform.

The saturated graminoid shrub wetlands are vegetated to a high degree, with a deciduous shrub component, and are exposed to annual flooding during spring break-up.

Table 1-E. General Habitat Suitability

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
E1. Wetland or water is not fragmented.	No	Yes	The question, as stated, is vague because "fragmented" is not defined. The WFA on p. 2 states that the functional assessment procedure was based, in part, on the U.S. Army Corps of Engineers Regulatory Guidance Letter (RGL 09-01). If, then, this question is derived from the RGL 09-01, Wetland Functions Data Form-Alaska Regulatory Best Professional Judgment Characterization, then the corresponding question there reads, "Wetland is not fragmented by development." The answer is, "Yes, this wetland is not fragmented by development", because, to date, no oil and gas infrastructure development has occurred in the proposed GMT-1 project area.
E2. Area surrounding wetland or water is undisturbed.	No	Yes	We disagree that the area surrounding the saturated graminoid shrub wetlands in the GMT-1 project area are disturbed. Figure 2 of the WFA shows that the GMT-1 road, drill pad and pipelines will be placed in a previously undisturbed area, with no existing oil and gas infrastructure aside from the to-be-built CD5 pad. According to Table 3 of the WFA, the total acreage of saturated graminoid shrub wetlands to be impacted by the GMT-1 road, drill site, CD5 to GMT-1 pipeline VSMs, Clover material site and valve pads is 82.59 acres. Figure 3 of the WFA (depicted at an entirely different scale than Figure 2) shows the wetland types surrounding the proposed new VSMs for a new, third pipe rack running from CD1 to CD4N; according to Table 3 of the WFA, the associated acreage for saturated graminoid shrub wetlands along this path is only 0.01 acres. Although the CD1 to CD4N pipe rack would be situated in previously disturbed area, its saturated graminoid shrub footprint is less than a thousandth of a percent of the area of saturated graminoid shrub that will be constructed in an entirely undisturbed area.
E3. Evidence of wildlife use (e.g. nests, tracks, scat, gnawed stumps, survey data) is present. Waters only high functioning if wildlife survey or direct observation data are available.	Yes	Yes	EPA agrees with ABR's characterization of this attribute. The GMT-1 Draft Supplemental EIS documents moist sedge-shrub tundra and moist tussock tundra as potential high value bird habitat in the GMT-1 project study area (BLM 2014, Table 4.3-8). The saturated graminoid shrub wetland functional class is comprised of these two types, moist sedge shrub tundra and moist tussock tundra (WFA Table 2).

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
E4. Plant community has two or more strata, with at least two of those strata having >10% total cover.	Yes	Yes	EPA agrees with ABR's characterization of this attribute. The saturated graminoid shrub wetland type consists of non-vascular plants (mosses and lichens), graminoids (grasses and sedges) and shrubs (including the woody plants *Dryas integrifolia, Salix reticulata, Salix lanata richardsonii, Salix planifoia pulchra, Vaccinium vitis-idaea, Betula nana,* and *Salix phlebophylla*; Jorgensen et al 2003). There are thus at least three strata in this wetland type. All three of these strata exceed 10% total cover, as documented in Figure 16 of Jorgensen et al (2003).
E5. Wetland has at least a moderate degree of Cowardin Class interspersion.	No	Yes	EPA assumes that this question is derived from the WET method, Predictor #16, Vegetation Class Interspersion (predictor for breeding, migration, and wintering) (Adamus et al. 1991). This predictor was originally targeted to identify use by waterbirds and other specific water-dependent species groups. In the lower 48 states, interspersion of vegetation types is selectively favored by these groups. EPA suggests that the interspersion identified in WET takes on a different definition on the Arctic tundra. Furthermore, many species of wildlife do not require interspersion of vegetation classes to support habitat uses such as shorebird nesting, hunting bird habitat, grazing by caribou, feeding by brown bears, feeding and denning by arctic foxes. In this WFA, the amount of interspersion that would constitute a "moderate degree" is not defined or described, making it not possible to answer the question with predictability and repeatability. Study of imagery of the proposed GMT-1 project footprint area shows a high degree of interspersion of vegetation types across the NE NPR-A landscape. This can also clearly be seen on Figures 2 and 3 of the WFA, which focus on the wetland types immediately adjacent to the proposed project footprint. On Figure 2, the saturated graminoid shrub wetland type (in light green) in the GMT-1 road and pipeline corridor is interspersed with 53 map-polygons of different colors (i.e. different Cowardin classes). On Figure 3, the smaller area for the new pipe rack between CD1 and CD4N shows 16 map-polygons of different colors (i.e. different Cowardin classes) than the saturated graminoid shrub wetland type.
E6. Diversity (evenness of cover) of plant species is moderately high (≥ 5% species with at least 10% cover each).	No	N/D	It is not possible to determine plant species diversity without ground-derived information.

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
			The rapid desktop analysis will not capture this attribute. Furthermore, EPA suggests that plant species diversity is less important to general habitat suitability in the Arctic than in the temperate systems where this attribute was identified as having importance, and that importance being limited to wetland-dependent birds (Adamus et al. 1991, Predictor #17). For example, wetlands dominated by *Arctophila fulva* are very important in supporting grazing by waterfowl; wetlands which support lemmings will provide feeding for foxes and bears, and rodent support is not dependent on high plant species diversity. Therefore, plant species diversity seems inappropriate as an identifier of general habitat suitability.

Rating for General Habitat Suitability. ABR rated the saturated graminoid shrub wetlands as moderate for the general habitat suitability function, based on two "Y" answers out of a possible six questions. ABR also comments (on page A-22) that the wetland provides moderate function in this general category, and that the wetland is fragmented by disturbance but represents the majority of the landcover in the area and would provide general habitat function for a variety of common wildlife species in the area.

EPA finds that the saturated graminoid shrub wetland type performs the general habitat suitability function at a high level, based on five "Y" answers out of five possible questions. (Note that one of the six questions could not be answered because the answer could not be determined using a desktop analysis, and because the question was not applicable to the Arctic.) These wetlands in the proposed GMT-1 project area have not been fragmented by development, are not disturbed, have a complex vegetative structure, have been documented as high potential bird habitat (BLM 2014), are interspersed with other wetland types and provide habitat for a variety of invertebrate, avian and mammal species.

Function F. Fish Habitat: Function only applicable if a water or if wetland has perennial or intermittent surface water connection to a fish bearing water body.
EPA agrees with ABR's assessment that the fish habitat function does not apply to the saturated graminoid shrub wetland type.

Table 1-G. Educational, Scientific, Recreational, or Subsistence Use

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
G1. Site has documented scientific or educational use.	No	Yes	The GMT-1 project area (formerly known as the proposed CD-6 development area) has been studied by several disciplines for more than a decade, for purposes of determining baseline information and preparing environmental documents (such as the Draft Supplemental EIS currently under review). For example, vegetation and ecological surveys were conducted in the Fish Creek drainage starting in August 2001 (Jorgenson et al. 2003, p. 3); the results – prepared for ConocoPhillips – form the cornerstone of the ITU analysis used in this WFA. Other targeted, scientific studies in this area that are referenced in the EIS relate to soils and permafrost, water resources, hydrology, fish, birds, mammals, threatened and endangered species, and subsistence use (BLM 2014, Chapters 3 and 6).
G2. Wetland or water is in public ownership.	Yes	Yes	We agree with ABR's answer to this question. The proposed GMT-1 drill site and gravel source are wholly on federal lands within the northeastern portion of the NPR-A. The proposed road and pipeline corridors cross both federal and private lands (held by Kuukpik Corporation) within the NPR-A (BLM 2014, p. 1).
G3. Accessible trails are available.	No	Yes	The Draft Supplemental EIS documents overland use areas, with transportation primarily by snowmachine in the winter months, but also by 4-wheeler during the summer and fall (BLM 2014, p. 148). A map of Nuiqsut Travel Routes in the Project Area shows seven trails that would cross the proposed footprint of the GMT-1 development (*ibid.*, Figure 3.4-10).
G4. Wetland or water supports subsistence activities (e.g., hunting, fishing, berry picking).	Yes	Yes	We agree with ABR's answer to this question. Subsistence use of the area, including of the extent of saturated graminoid shrub wetland type evaluated in the WFA, is shown to be of high intensity (BLM 2014, Figure 3.4-1).

Rating for Educational, Scientific, Recreational, or Subsistence Use. ABR rated the saturated graminoid shrub wetlands as moderate for the educational, scientific, recreational or subsistence use function, based on two "Y" answers out of a possible four questions. ABR also comments (on page A-22) that the project area is in close proximity to Nuiqsut and both the Fish Creek and Colville River Delta which have considerable value for subsistence activities.

EPA finds that the saturated graminoid shrub wetland type performs the general educational, scientific, recreation or subsistence use function at a high level, based on four "Y" answers out of four possible questions. The northeastern portion of the NPR-A has been the subject of numerous scientific studies for at least a decade in preparation for opening this region to oil and gas development. Subsistence use is high, and is well documented.

Table 1-H. Uniqueness and Special Status

Best Professional Judgment Characterization Questions	ABR Answers	EPA Answers	Rationale for EPA's Answers
H1. Wetland or water contains documented occurrence of a state or federally listed threatened or endangered species. *If yes, wetland is high functioning.*	No	No	The Draft SEIS, Section 3.3.5 (BLM 2014) does not document use of the saturated graminoid shrub wetland type by threatened or endangered species.
H2. Wetland or water contains documented critical habitat, high quality ecosystems, or priority species, respectively designated by the U.S. Fish and Wildlife Service	No	No	The Draft SEIS, Section 3.3.5 (BLM 2014) does not document these attributes in the saturated graminoid shrub wetland type.
H3. Wetland or water has biological, geological, or other features that are determined to be rare.	No	No	The scope of this question is not clear. Although we agree that the saturated graminoid shrub wetland type is not a rare type on the Arctic Coastal Plain, it may be globally rare.
H4. Wetland or water has been determined significant because it provides functions scarce for the area.	No	No	We agree with ABR's answer to this question.
H5. Wetland complex contains one or more of the following habitats: 1) Tall shrub habitat (>.5 ft in height) dominated by *Salix* sp. 2) Aquatic herb habitat dominated by *Arctophila fulva*. 3) Semi-permanently flooded to permanently flooded vegetated portions of drained lake basins. 4) Anadromous fish overwintering habitat. 5) Patterned wet sedge meadow or low center polygons. 6) High center polygon complex. 7) Riverine coastal mudflats. 8) Non-patterned wet meadow adjacent to streams and river bluffs.	No	Yes	Patterned ground – including both high center polygon complex and low center polygons – is plainly seen on GoogleEarth imagery dated August 12, 2012 along the proposed GMT-1 road and pipeline route, within the saturated graminoid shrub wetland type as it is mapped in the WFA Figure 2. The association of moist sedge-shrub tundra and tussock tundra vegetation types – which make up the saturated graminoid shrub wetland type – with ice-wedge polygons is further described in Jorgenson 2003 (in Table 7).

Rating for Uniqueness and Special Status. ABR rated the saturated graminoid shrub wetlands as low for the uniqueness and special status function, based on no "Y" answers out of a possible five questions. ABR also comments (on page A-22) that this wetland type is not designated as critical habitat, and there are no documented occurrences of TES species.

EPA finds that the saturated graminoid shrub wetland type performs the uniqueness and special status function at a moderate level, based on one "Y" answer, in accordance with the rating criteria for this function (≥2 attributes (Y) – High, 1 attribute (Y) – Moderate, None – Low). The saturated graminoid shrub wetlands in the project area are typified by patterned ground (both high center and low center polygons).

Table 2 summarizes the ABR and EPA wetland functional rankings for the saturated graminoid shrub wetland type. Out of the eight functions evaluated, ABR has found four to be Moderate, one to be Low and three to be not applicable. EPA has found six to be High, one to be Moderate, and one to be not applicable.

Table 2. Summary of ABR and EPA functional rankings for the saturated graminoid shrub wetland type.

Function	ABR ranking	EPA ranking
Flood Flow Regulation	Moderate	High
Sediment, Nutrient, & Toxicant Removal	Moderate	High
Erosion Control and Shoreline Stabilization	N/A	High
Organic Matter Production & Export	N/A	High
General Habitat Suitability	Moderate	High
Fish Habitat	N/A	N/A
Subsistence, Recreational, Educational Value	Moderate	High
Uniqueness & Special Status	Low	Moderate

Based on our analysis, we recommend an overall HIGH functional ranking for the saturated graminoid shrub wetland type.

References

ABR, Inc. – Environmental Research & Services. 2013. Wetland Functional Assessment for the Greater Mooses Tooth Unit Development Project – 2013, Final Report. Prepared for ConocoPhillips Alaska, Inc. Anchorage, Alaska. 16 pp. + Appendix.

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Michael Baker Jr., Inc. 2013. *2013 Fish Creek Basin Spring Breakup Monitoring and Hydrologic Assessment.* Anchorage, Alaska. 75 pp. + Appendix.

Enclosure 3
U.S. Environmental Protection Agency Rating System for Draft Environmental Impact Statements Definitions and Follow-Up Action*

Environmental Impact of the Action

LO – Lack of Objections

The U.S. Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC – Environmental Concerns

EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

EO – Environmental Objections

EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU – Environmentally Unsatisfactory

EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1 – Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 – Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

Category 3 – Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.